

# NATIONAL REVIEW

## The Triumph of Biotechnology and Private Capital

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And how the Democrats' plans to boost capital-gains taxes may discourage future innovation.

We continue to fight COVID-19 and its variants, but the rapid development of vaccines last year put us on the offensive against the disease. Vaccines from Moderna of Massachusetts and BioNTech of Germany have led the way, with 360 million doses delivered in the United States to date. (BioNTech teamed with Pfizer for the manufacturing and distribution of its shot.)

The federal government expedited drug approvals and helped to fund the vaccine roll-out. But how were Moderna and BioNTech able to design and deliver highly effective vaccines so quickly — in months, rather than the years it usually takes for vaccines?

The answer is that the two companies had been working on the mRNA technologies behind the vaccines for a decade, and they were supported by more than \$3 billion of private capital. Moderna's and BioNTech's vaccines are a triumph of the biotechnology industry and of the venture capitalists and wealthy angel investors who fund it.

The large potential of mRNA technology now seems clear, but that was not always the case. Katalin Karikó at the University of Pennsylvania spent years studying mRNA, but she received little academic or government support. Fortunately, Karikó and her colleague Drew Weissman made a breakthrough in the early 2000s for practical applications of mRNA technologies.

Derrick Rossi of Harvard Medical School added his own advances and then teamed with a group of scientists and venture-capital firm Flagship Pioneering to found Moderna in 2010. Moderna's "highly risky" plan was to "cut out the middleman in biotech [by] creating therapeutic proteins inside the body instead of in manufacturing plants." Skepticism "dogged Moderna since its creation," reported the *Wall Street Journal*, especially since the big pharmaceutical companies were not pursuing the approach.

But Moderna plowed ahead, supported by venture capitalists and angel investors. The company had raised more than \$2 billion in private capital before going public in 2018. Many people think that federal funding is crucial for medical research, but that was not the case for Moderna. Prior to 2020, the company received just two federal awards totaling \$150 million, a fraction of the private funding it received.

Meanwhile, in Germany, biotech entrepreneurs Uğur Şahin and Özlem Türeci co-founded BioNTech in 2008 to explore advances in mRNA technologies. The startup received a €180 million angel investment from Thomas and Andreas Struengmann, brothers who had gained wealth by building drug firm Hexal. BioNTech raised a total of \$1.3 billion in private investment before it went public in 2019. Like Moderna, the company appears to have received relatively little government funding before 2020, only a few tens of millions of dollars.

Applying their knowledge from years of research, both Moderna and BioNTech responded quickly when they learned of the new virus in January 2020. When the Chinese published COVID-19's genetic code, it took Moderna just two days to design a vaccine and 42 days to ship vials of the drug to the National Institutes of Health. Both companies gained government approval for their vaccines by December and began distributing millions of doses. These are the world's first vaccines created by mRNA technologies.

People often claim that capitalism focuses only on short-term profits. But the venture capitalists and angel investors who fund firms such as Moderna and BioNTech are hugely patient, and they lose money on most of their investments. Typically, their model rests on the calculation that a small percentage of their investments will generate a sufficiently high return on going public or being sold to both "pay" for those that — as will often be the case in a very tricky sector — lose money (or make very little) *and* make the sort of good money that they and their clients are expecting when putting together an investment portfolio.

In biotechnology and other leading-edge industries, after-tax investor gains are often reinvested in the next round of risky startups, thus creating a virtuous cycle. If the government had taxed away the Struengmanns' capital gains from selling Hexal, they might not have had the cash or incentive to invest in BioNTech. One of the reasons that nearly all high-income countries keep

capital-gains taxes low is to help ensure that investors and entrepreneurs are incentivized to take the risk of committing time and resources to ventures that can offer no promise of a good return, the sort of ventures, in other words, so typical of ventures relying on scientific and technical innovation. Those who take high risks should be rewarded, if that risk works out, with high rewards.

Unfortunately, that logic eludes President Biden and congressional Democrats. They not only would like to raise capital-gains-tax rates, but some of them would also like to broaden the capital-gains-tax base, including by taxing gains *before* they are realized. If applied to startup investing, that could do terrible damage to the ability of early stage companies to secure the patient capital that they need. Punishing capital gains makes no sense if we want investors and entrepreneurs to pursue valuable but risky growth opportunities.

Some cynics are griping about the big profits that Moderna and BioNTech are now making, but investors in those firms absorbed losses for a decade. Besides, there is no better place for profits to flow right now than to biotech firms and their research. BioNTech announced that it will build on its mRNA advances to develop shots against malaria and tuberculosis, which together kill more than a million people a year. And numerous biotech firms are now aiming to create more effective influenza vaccines based on mRNA technologies.

One of the key moments in the development of the biotech sector as we know it today was the launch of Genentech in 1976, backed by venture-capital firm Kleiner Perkins. The success of that pioneering firm “gave credence to the view that scientific research, infused with start-up firm spunk, could be a critical component of economic growth,” noted a history of the industry by Walter Powell and Kurt Sandholtz.

To undermine an approach that has worked so well, and delivered so much, by raising capital gains makes no economic sense. Worse still, as we consider the lives saved or improved by companies in biotechnology and other innovative sectors, companies that relied on private risk capital, it may well come at considerable human cost, too.

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